

RECEIVED
JAN 17 2001
TECH CENTER 1600/2900

CLAIMS

1. A method of increasing the yield of a plant comprising transforming a plant with a DNA construct comprising one or more DNA sequence(s) coding for a protein involved in sucrose sensing, transport, metabolism and/or uptake operable linked to a controllable promoter region and optionally operable linked to a transcription terminator and controlling the level, time and spatial location of expression of said DNA sequence(s) from said controllable promoter region by application of an external chemical inducer whereby the yield of said transgenic plant is increased.
2. A method of increasing the yield of a plant according to claim 1 by selectively increasing the importation of fixed carbon into photosynthetically inactive sink tissue comprising transforming a plant with a DNA construct comprising one or more DNA sequence(s) coding for a protein involved in sucrose sensing, transport, metabolism and/or uptake operably linked to a controllable promoter region and optionally operably linked to transcription terminator and controlling the level, time and spatial location of expression of said DNA sequence(s) from said controllable promoter region by application of an external chemical inducer whereby the transportation of fixed carbon from photosynthetically active source tissue to photosynthetically inactive tissue of said transgenic plant is selectively increased.
3. [deleted]
4. A method according to claim 1 wherein said DNA sequence(s) include those DNA sequences coding for proteins involved in the transport, uptake and subsequent metabolism of sucrose, such as in sucrose biosynthesis; in the transport of reserves during dormancy such as in phloem loading; in long distance phloem transport and in phloem unloading; and in the utilization of assimilates such as sucrose-derived metabolites.
5. A method according to claim 4 wherein said DNA sequence(s) include those coding for sucrose synthase, phosphofructokinase, invertase, hexokinase, inorganic pyrophosphorylase or ATPase.
6. A method according to claim 5 wherein the DNA sequence codes for an invertase.
7. A method according to claim 1 wherein said controllable promoter region comprises a chemically inducible promoter system.
8. A method according to claim 7 wherein the chemically inducible promoter is under the control of a tissue or organ selection promoter.
9. A method according to claim 7 wherein said chemically inducible promoter system comprises the alcA/alcR promoter system.
10. A method according to claim 9 wherein expression of the alcR regulatory protein is under the control of a tissue or organ selective promoter.

11. A DNA construct comprising a DNA sequence(s) coding for a protein involved in sucrose metabolism, uptake and or transport operably linked to a controllable promoter region.
12. A DNA construct according to claim 11 wherein said controllable promoter region comprises a chemically inducible promote system.
13. A DNA construct according to claim 12 wherein said chemically inducible promoter system is the alcA/alcR switch promoter system.
14. A DNA construct according to claim 13 wherein the alcR regulatory protein is under the control of a tissue or organ selective promoter.
15. A DNA construct according to claim 11 wherein said DNA sequence(s) comprise a DNA sequence coding for an invertase.
16. Plant tissue transformed with a DNA construct according to any one of claims 11 to 15 and the progeny of said plants.
17. [deleted]